

WHAT IS CLAIMED IS:

1. A long magnet comprising:
 - a magnet block made of a mixture of rare earth magnetic powder, thermoplastic resin particles, fluidity additive, pigment, wax, and charge control agent; and
 - a reinforcing member to reinforce the magnet block, at least part of the reinforcing member being arranged inside of the magnet block.
- 10 2. The long magnet according to claim 1, wherein the reinforcing member is made of metal.
3. The long magnet according to claim 1, wherein the reinforcing member is made of magnetic material.
- 15 4. The long magnet according to claim 1, wherein the reinforcing member is made of magnet material.
5. The long magnet according to claim 1, wherein the reinforcing member is made of flexible material.
- 20 6. The long magnet according to claim 5, wherein the flexible material contains magnetic powder.
- 25 7. The long magnet according to claim 6, wherein the magnetic

powder is rare earth-type magnetic powder.

8. The long magnet according to claim 1, wherein the reinforcing member is composed of two or more materials.

5

9. The long magnet according to claim 1, wherein a flexural strength of the reinforcing member is higher than that of the magnet block.

10 10. The long magnet according to claim 1, wherein the reinforcing member has same length as that of a longitudinal direction of the magnet block and is arranged to cover the whole length of the longitudinal direction of the magnet block.

15 11. The long magnet according to claim 1, wherein a plurality of the reinforcing members are provided and arranged discontinuously in a longitudinal direction of the magnet block.

20 12. The long magnet according to claim 1, wherein a plurality of the reinforcing members are provided and arranged inside of the magnet block in a layer structure.

25 13. The long magnet according to claim 1, wherein protrusions are formed on the reinforcing member and the protrusions intrude into the magnet block.

14. The long magnet according to claim 1, wherein the reinforcing member is formed in a mesh-like form.

5 15. The long magnet according to claim 1, wherein the reinforcing member is made of a film-like material.

16. A long magnet comprising:

a magnet block made of a mixture of rare earth magnetic powder, thermoplastic resin particles, fluidity additive, pigment, wax, and charge control agent; and

a plurality of reinforcing members to reinforce the magnet block, at least one of the reinforcing member being arranged on one side of a longitudinal direction of the magnet block.

15

17. The long magnet according to claim 16, wherein the reinforcing member is made of metal.

18. The long magnet according to claim 16, wherein the reinforcing member is made of magnetic material.

19. The long magnet according to claim 16, wherein the reinforcing member is made of magnet material.

25 20. The long magnet according to claim 16, wherein the reinforcing

member is made of flexible material.

21. The long magnet according to claim 20, wherein the flexible material contains magnetic powder.

5

22. The long magnet according to claim 21, wherein the magnetic powder is rare earth-type magnetic powder.

10 23. The long magnet according to claim 16, wherein the reinforcing member is composed of two or more materials.

24. The long magnet according to claim 16, wherein a flexural strength of the reinforcing member is higher than that of the magnet block.

15

25. The long magnet according to claim 16, wherein the reinforcing member has same length as that of the longitudinal direction of the magnet block and is arranged to cover the whole length of the longitudinal direction of the magnet block.

20

26. The long magnet according to claim 16, wherein a plurality of the reinforcing members are provided and arranged discontinuously in the longitudinal direction of the magnet block.

25 27. The long magnet according to claim 16, wherein a plurality of

the reinforcing members are provided and arranged inside of the magnet block in a layer structure.

28. The long magnet according to claim 16, wherein protrusions are
5 formed on the reinforcing member and the protrusions intrude into the magnet block.

29. The long magnet according to claim 16, wherein the reinforcing member is formed in a mesh-like form.

10

30. The long magnet according to claim 16, wherein the reinforcing member is made of a film-like material.

31. The long magnet according to claim 16, wherein a surface of the
15 reinforcing member that makes a contact with the magnet block is rough.

32. The long magnet according to claim 16, wherein ends of the reinforcing member of the longitudinal direction of the magnet block are
20 made thicker than a middle portion thereof.

33. The long magnet according to claim 16, wherein ends of the longitudinal direction of the magnet block are made thinner than a middle portion thereof.

25

34. A manufacturing method of a long magnet, comprising:
mixing of rare earth magnetic powder, thermoplastic resin
particles, fluidity additive, pigment, wax and charge control agent; and
molding a reinforcing member integrally with the mixture in a
5 mold by compression molding.

35. A magnet roller comprising:
a plastic magnet formed in a shape of a cylinder and having a
groove that extends in a longitudinal direction of the plastic magnet;
10 and
a long magnet arranged and fixed to the groove, wherein the
long magnet includes
a magnet block made of a mixture of rare earth magnetic
powder, thermoplastic resin particles, fluidity additive, pigment, wax,
15 and charge control agent; and
a reinforcing member to reinforce the magnet block, at
least part of the reinforcing member being arranged inside of the
magnet block.

20 36. A magnet roller comprising:
a plastic magnet formed in a shape of a cylinder and having a
groove that extends in a longitudinal direction of the plastic magnet;
and
a long magnet arranged and fixed to the groove, wherein the
25 long magnet includes

· a magnet block made of a mixture of rare earth magnetic powder, thermoplastic resin particles, fluidity additive, pigment, wax, and charge control agent; and

5 a plurality of reinforcing members to reinforce the magnet block, at least one of the reinforcing member being arranged on one side of a longitudinal direction of the magnet block.

37. An image forming apparatus comprising:

10 a developing unit that includes a magnet roller including a plastic magnet formed in a shape of a cylinder and having a groove that extends in a longitudinal direction of the plastic magnet; and

15 a long magnet arranged and fixed to the groove, wherein the long magnet includes

20 a magnet block made of a mixture of rare earth magnetic powder, thermoplastic resin particles, fluidity additive, pigment, wax, and charge control agent; and

25 a reinforcing member to reinforce the magnet block; at least part of the reinforcing member being arranged inside of the magnet block; and

30 a nonmagnetic sleeve that is arranged on an outer periphery of the magnet roller.

38. An image forming apparatus comprising:

25 a developing unit that includes a magnet roller including

a plastic magnet formed in a shape of a cylinder and having a groove that extends in a longitudinal direction of the plastic magnet; and

a long magnet arranged and fixed to the groove, wherein

- 5 the long magnet includes

a magnet block made of a mixture of rare earth magnetic powder, thermoplastic resin particles, fluidity additive, pigment, wax, and charge control agent; and

a plurality of reinforcing members to reinforce the

- 10 magnet block, at least one of the reinforcing member being arranged on one side of a longitudinal direction of the magnet block; and

a nonmagnetic sleeve that is arranged on an outer periphery of the magnet roller.